

**REQUEST TO REDESIGNATE
Christian County, Kentucky
LOCATED WITHIN THE**

**CLARKSVILLE-HOPKINSVILLE, TN-KY, MSA
8-HOUR OZONE NONATTAINMENT AREA**



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INTRODUCTION

The Clarksville-Hopkinsville, Tennessee and Kentucky, Metropolitan Statistical Area (MSA) was designated in a *Federal Register* notice on April 30, 2004 (*Appendix A*), as nonattainment area for the 8-hour National Ambient Air Quality Standard (NAAQS), effective June 15, 2004. The Commonwealth of Kentucky requests that the United States Environmental Protection Agency (U.S. EPA) redesignate the Christian County, Kentucky, portion of the Clarksville-Hopkinsville, TN-KY MSA to attainment for the 8-hour ozone standard pursuant to 107 (d)(3) of the 1990 Clean Air Act Amendments (CAAA). The MSA consists of Christian County, Kentucky and Montgomery County, Tennessee. The state of Tennessee is separately submitting a request that the Tennessee portion of this nonattainment area be redesignated to attainment.

In accordance with section 110(k) of the Clean Air Act Amendments of 1990, Kentucky's request to amend the SIP is based on the most recent three years of monitoring data showing no additional violations of the 8-hour ozone standard for the 2002-2004 time period, and a calculated ozone design value for 2002-2004 data that is attaining the NAAQS. Implementation of permanent and enforceable reductions in ozone precursor emissions have occurred; and emission projections demonstrate that the 2004 attainment year emission levels in this area will not be exceeded during the next 12 years.

This redesignation request was prepared in accordance with U.S. EPA Guidance issued in 1992, in memorandums on June 23 and September 4 from John Calcagni (*Appendix B*), and additional guidance provided by memorandum on September 17, 1993, from Michael H. Shapiro (*Appendix B*).

BACKGROUND

The Clean Air Act (CAA) establishes a process for air quality management through the NAAQS. Area designations are required after promulgation of a new or revised NAAQS. On July 18, 1997, U.S. EPA promulgated a revised ozone standard of 0.08 parts per million (ppm), measured over an 8-hour period. The 8-hour standard is more protective of public health and more stringent than the previous 1-hour standard. The NAAQS rule was challenged by numerous litigants and in May 1999, the U.S. Court of Appeals for the D.C. Circuit issued a decision remanding, but not vacating, the 8-hour standard. Among other things, the Court recognized that U.S. EPA is required to designate areas for any new or revised NAAQS in accordance with the CAA and addressed a number of other issues, which are not related to designations.

In February 2001, the Supreme Court upheld U.S. EPA authority to set the NAAQS and remanded the case back to the D.C. Circuit for disposition of issues the Court did not address in its initial decision. The Supreme Court also remanded the 8-hour implementation strategy to U.S. EPA. In March 2002, the D.C. Circuit rejected all remaining challenges to the 8-hour ozone standard.

The process for designations following promulgation of a NAAQS is contained in section 107(d)(1) of the CAA. The Transportation Equity Act for the 21st Century (TEA-21) extended by 1 year the time for U.S. EPA to designate areas for the 8-hour NAAQS. Thus, U.S. EPA was required to designate areas for the revised ozone standard by July 2000. However, U.S. EPA's appropriations bill in 2000 restricted the agency's authority to spend money or designate areas

until June 2001 or the date of the Supreme Court ruling on the standard, whichever came first. As noted earlier, the Supreme Court decision was issued in February 2001.

In 2003, several environmental groups filed suit in district court claiming U.S. EPA had not met its statutory obligation to designate areas for the 8-hour NAAQS. U.S. EPA entered into a consent decree, which required U.S. EPA to issue the designations by April 15, 2004. In accordance with Section 107(d)(1) of the CAAA, a *Federal Register* notice published on April 30, 2004, designated the Clarksville-Hopkinsville, Tennessee and Kentucky, MSA to be nonattainment for the 8-hour ozone NAAQS, effective June 15, 2004.

IMPROVEMENT IN AIR QUALITY

The 8-hour ozone nonattainment designation was based on air quality data collected from 2001 through 2003 that exceeded the specified NAAQS level of 0.08 parts per million (ppm). In 2004 the ambient ozone data for Christian County in the Kentucky portion of the nonattainment area indicated no further exceedances of the 8-hour standard and resulted in a decline in the design value for the most recent three-year period (2002-2003-2004). The ambient data is included in *Appendix C*.

Table 1 is a summary of the number of days annually, in which the 8-hour NAAQS for ozone (0.08 parts per million) was exceeded in Christian County, Kentucky. The monitor is located at 10800 Pilot Rock Road in Hopkinsville, Kentucky, and is operated by the staff of the Tennessee Valley Authority (TVA). No ozone data was collected in Montgomery County, Tennessee, for the full three-year period of 2002 through 2004.

TABLE 1.
SUMMARY OF 8-HOUR OZONE EXCEEDANCES THAT OCCURRED ANNUALLY

County	2001	2002	2003	2004
Christian	1	9	2	0

The table below is a summary of the calculated design value of for the 8-hour ozone NAAQS for Christian County, Kentucky. The overall downward trend is shown in the concentration (ppm).

TABLE 2.
ANNUAL 4TH MAX HIGH AND DESIGN VALUE FOR 8-HOUR OZONE (PARTS PER MILLION)

Year	(ppm)
1995	0.074
1996	0.079
1997	0.082
1998	0.086
1999	0.092
2000	0.081
2001	0.082
2002	0.093
2003	0.080
2004	0.074
Period	
1995-97	0.078
1996-98	0.082
1997-99	0.086
1998-00	0.086
1999-01	0.085
2000-02	0.085
2001-03	0.085
2002-04	0.082

The collected data was quality-assured in accordance with 40 CFR 58 and was recorded in the U.S. EPA Air Quality System (AQS). It is anticipated that this monitor, located on residential property and operated by TVA staff, will remain at its current location for the foreseeable future.

For this SIP revision, Kentucky first had to develop a Baseline Emissions Inventory for this newly designated nonattainment area. The year 2002 was chosen as the base year for developing a comprehensive ozone precursor emissions inventory for which projected emissions could be developed for 2004, 2007, 2010, 2013, and 2016. Kentucky chose 2004 as the attainment year because this is the most current ozone data available, and which, added then to the three-year period (2002-2004), brings the design value into attainment with a calculated value of 0.082 ppm. This inventory is included in *Appendix D*.

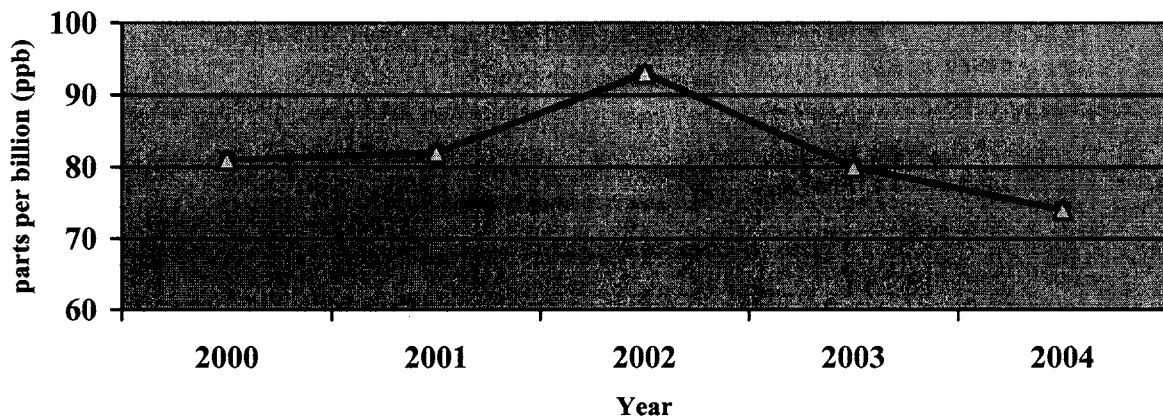
PERMANENT AND ENFORCEABLE EMISSION REDUCTIONS

The improvement in air quality in the Clarksville-Hopkinsville, TN-KY, MSA ozone nonattainment area, as verified by the lower design value, is due to the implementation of permanent and enforceable emission reductions. Certainly the favorable pattern of weather conditions contributed to the lower levels of ozone formations, however Kentucky is able to identify significant permanent and enforceable reductions that occurred as well during this very short timeframe of 2001-2004.

A thorough review of air monitoring data over the last five years shows a steady decline in overall ozone values throughout the region, with the exception of 2002 (Graph 1). It can be

argued that 2002 was the meteorological anomaly and that without the unusual weather patterns of 2002, the area would have been in compliance before final designations were made.

Graph 1.
Annual 4th Max High Trend for 8-Hour Ozone



Emission reductions (in tons per day, or tpd) are described below are from various programs and initiatives. The following categories of sources have shown or are expected to show emission reductions in volatile organic compounds (VOCs), carbon monoxide (CO), and oxides of nitrogen (NOx) emissions due to regulatory measures implemented, both by the U.S. EPA and the Commonwealth of Kentucky.

For this SIP revision, Kentucky chose to use 2002 as the base year for developing a comprehensive ozone precursor emissions inventory for which certain projected emissions could be developed for 2004, 2007, 2010, 2013, and 2016. Kentucky chose 2004 as the attainment year because this is the most current ozone data available, and which, added then to the three-year period (2002-2004), brings the design value into attainment with a calculated value of 0.082 ppm.

2001-2004 EMISSION REDUCTION PROGRAMS

The following information outlines emission reduction measures that have occurred from 2001 through 2004.

HIGHWAY MOBILE SOURCE REDUCTIONS

Federal Motor Vehicle Control Programs (FMVCP)

Permanent and enforceable reductions have been and continue to be achieved each year through this program. In recent years, stricter federal requirements have been imposed on automobile manufacturers for improved fuel-efficiency and extended warranties for emission control devices. Documentation of these emission reductions is contained in the highway mobile modeling runs (*Appendix E*).

Fleet Turnover of Automobiles

Permanent and enforceable emission reductions have occurred in the Clarksville-Hopkinsville, TN-KY, MSA nonattainment area as a result of fleet turnover of automobiles. As older, less efficient automobiles are replaced by newer, more efficient models, the emissions decrease on a per mile basis. Quantification of these reductions is contained in the highway mobile modeling runs (*Appendix E*).

Tier 2 Vehicle Emissions and Fuel Standards

Permanent and enforceable reductions will occur through this program. The overall Tier 2 program focuses on reducing the passenger car and light truck emissions most responsible for causing ozone. In 2004, the Tier 2 standards began to phase in for the first time a single set of federal tailpipe emission standards that apply to all passenger cars, light trucks, and larger

passenger vehicles (including sport utility vehicles, minivans, vans, and pickup trucks) operated on any fuel. In 2007, when the new standards will be fully phased in, U.S. EPA projects that nationwide NO_x reductions from cars and trucks will be 856,471 tons per year (tpy). U.S. EPA further projects a NO_x reduction of 1,236,000 tpy by 2010, and reductions reaching an estimated 2,220,00 tpy in 2020. Quantification of these reductions for Kentucky is contained in the highway mobile model runs (*Appendix E*).

Heavy-Duty Engine and Vehicle and Fuel Standards

Permanent and enforceable reductions will occur through this program. This program will result in particulate matter and NO_x emission levels that are 90 percent and 95 percent below the standard levels in effect today, respectively. The rule mandates a 97 percent reduction in the sulfur content of diesel fuel. Quantification of these reductions is contained in the highway mobile modeling runs (*Appendix E*).

POINT SOURCE EMISSION REDUCTIONS

Reasonably Available Control Technology (RACT)

401 KAR 51:012, Section 1 (2) requires that all major air contaminant sources shall as a minimum apply control procedures that are reasonable, available, and practical.” See *Appendix F* for the full text of 401 KAR 50:012.

Maximum Available Control Technology (MACT)

The Clean Air Act requires U.S. EPA to review and update its lists of categories of industries that emit one or more of 188 listed toxic air pollutants, or Hazardous Air Pollutants (HAPS). For

listed categories of major industrial sources, the law requires U.S. EPA to develop standards requiring those industries to achieve emission reduction equivalent to putting into place what is known as “maximum achievable control technology” (MACT). Many of the HAPS under these industrial categories of controls are also VOCs, and compliance with these new MACT standards as they are being promulgated will decrease VOC emissions from the affected industries.

Additional Reductions - NO_x SIP Call Reductions

Although Kentucky is not claiming credit for these source reductions regarding the attainment status of the county, it is important to note ongoing and significant declining emission trends of any ozone precursors (ie., NO_x) that occurred during the current 2002-2004 years of ozone monitoring data.

The Tennessee Valley Authority Paradise Steam Plant, which is located in Muhlenburg County, Kentucky, is complying with applicable provisions of the NO_x SIP Call. As a result, significant ongoing NO_x emission reductions continue to occur due to the early installation and operation of Selective Catalytic Reduction (SCR) technology.

During the 2002 ozone season under the NO_x SIP Call (ie., March-September), TVA-Paradise requested 7841 tons in Early Reduction Credits (ERC). As well, TVA-Shawnee in McCracken County, requested 137 tons.

During the 2003 ozone season, TVA-Paradise requested 6890 ERC tons. TVA-Shawnee requested 38 ERC tons.

Additionally, the TVA Cumberland power plant in Stewart County, Tennessee, also installed SCR technology, with Unit 1 beginning operation in 2003 and Unit 2 in 2004. TVA-Cumberland did not request credits in 2002, however during the 2003 ozone season, TVA-Cumberland requested 4098 ERC tons. The reductions are summarized in Table 3 below.

Table 3. NO_x Reductions Requested under the NO_x SIP CALL

TVA Power Plant	County	2002	2003
Paradise	Muhlenberg, KY	7841	6890
Shawnee	McCracken, KY	137	38
Cumberland	Stewart, TN	0	4098
Ozone Season Totals →		7978	11,026

Any NO_x emission reductions achieved from the NO_x SIP Call throughout the entire region will contribute to the area's continued maintenance of the 8-hour ozone standard and future compliance with the ozone NAAQS.

AREA SOURCE CONTROLS

None noted.

NON-HIGHWAY MOBILE SOURCE REDUCTIONS

Until the mid-1990s, emissions from non-highway engines were largely uncontrolled. The non-highway category includes outdoor power equipment, recreational vehicles (ie., scooters, mopeds, all-terrain bikes, snowmobiles, etc.), marine vessels, personal watercraft, farm and construction machinery, lawn and garden equipment, locomotives, and many other applications. Certain federal rules have been implemented since the early 1990's that have resulted in permanent and enforceable emission reductions from these nonroad sources.

Implemented during the 2002-2004 timeframe were:

Small spark-ignition engines – This set of emissions standards for handheld applications (such as leaf blowers and chainsaws) phases in 2002 – 2007 and will result in an additional 70 percent reduction in hydrocarbons and NO_x.

Large spark-ignition engines – In 2004, these emission standards phased in to reduce NO_x and CO for many applications of industrial equipment, including forklifts, airport service equipment, generators, compressors, and welders.

Locomotives – The Tier 1 emissions standards apply to locomotives and locomotive engines manufactured from 2002 through 2004, and will reduce NO_x emissions by two thirds.

Land-based diesel engines – Applications include construction equipment such as backhoes, agricultural equipment such as tractors, material handling equipment such as heavy forklifts, industrial equipment such as airport service vehicles, and utility equipment such as generators and pumps. These more stringent standards to reduce NO_x apply to all engine sizes and are being phased in 2001 –2006.

These reductions were determined using the U.S. EPA's nonroad model and are reflected in the emissions provided in this document (*Appendix G*).

Table 4 summarizes VOC emissions in tons per day (tpd), from 2002, and 2004. The mobile emissions numbers were generated using MOBILE 6.2. Table 4 emissions are any permanent and enforceable emission reductions achieved in the area during the short span from 2002 to 2004.

TABLE 4.
CHRISTIAN COUNTY 8-HOUR OZONE MAINTENANCE AREA
VOC EMISSIONS FOR 2002 AND 2004
(TONS PER DAY)

SOURCE CATEGORY	2002 BASE YEAR	2004 ATTAINMENT YEAR
POINT	1.77	1.87
AREA	4.36	4.40
HIGHWAY MOBILE*	4.30	3.83
NON-HIGHWAY MOBILE**	1.44	1.33
TOTAL EMISSIONS	11.87	11.43

*Calculated using Mobile6.2

**Calculated using USEPA's Non-Road Model

Table 5 summarizes NO_x emissions in tons per day (tpd), from 2002 and 2004. The mobile emissions numbers were generated using MOBILE 6.2. Table 5 emissions are any permanent and enforceable emission reductions achieved in the area during the short span from 2002 to 2004.

TABLE 5.
CHRISTIAN COUNTY 8-HOUR OZONE MAINTENANCE AREA
NO_x EMISSIONS FOR 2002 AND 2004
(TONS PER DAY)

SOURCE CATEGORY	2002 BASE YEAR	2004 ATTAINMENT YEAR
POINT	1.38	1.42
AREA	0.14	0.14
HIGHWAY MOBILE*	10.62	9.53
NON-HIGHWAY MOBILE**	3.89	3.80
TOTAL EMISSIONS	16.03	14.89

*Calculated using USEPA's Non-Road Model

**Calculated using USEPA's Non-Road Model

MAINTENANCE PLAN

Section 107(d)(3)(e) of the Clean Air Act Amendments of 1990 (CAAA) mandates that for an area to be redesignated to attainment, the U.S. EPA must approve a maintenance plan that meets the requirements of Section 175A. The maintenance plan must constitute a SIP revision and provide for maintenance of the air quality in an affected area for at least 10 years after redesignation. Kentucky has chosen to project emissions through the year 2016, which is 12 years after attainment.

The maintenance plan includes: an emissions inventory for the base year (2002); projected inventories for the attainment year 2004, interim years 2007, 2010, 2013, and the end year 2016; a commitment to maintain the existing ambient monitoring system; and contingency measures that may be put in place should the area have subsequent violations of the 8-hour ozone standard.

2002 BASE YEAR EMISSIONS INVENTORY

Since this is a newly designated nonattainment area, a base year inventory had not yet been submitted to U.S. EPA. A Base Year Emissions Inventory for 2002 for Christian County, Kentucky, in the Clarksville-Hopkinsville, TN-KY, 8-Hour Ozone Nonattainment Area is being submitted to the U.S. EPA (*Appendix D*). Documentation of the methodologies of the development of this inventory is also included in that appendix.

Kentucky believes the inventory submitted in this document to be a comprehensive inventory of actual emissions for the area and the best basis for which to make any future projections. The

2002 base year maintenance area emissions inventory methodology and documentation is included as *Appendix D*.

EMISSION PROJECTION METHODOLOGY

One of the planning elements listed in the Calcagni memorandum from September 1992 (Appendix B) that is required for attainment redesignation purposes is developing a projection inventory that indicates the area will remain in attainment and which includes emission projections for at least ten years after U.S. EPA's official redesignation approval. Kentucky's projection inventory through the year 2016, and the methodology for performing that inventory, is located in Appendix H.

The attainment year for Christian County is 2004, and Kentucky used the 2002 Emissions Inventory to project emissions to 2004 and beyond.

A maintenance demonstration requires comparison of the projected emissions inventory with the baseline inventory. If the projected emissions remain at or below the baseline emissions, there is a demonstration of maintenance. If, however, the projected emissions are above the baseline, then additional measures are required to ensure the projected emissions will remain at or below the baseline emissions.

Tables detailing the category projection inventories for VOC, CO, and NO_x emissions for the attainment year 2004, and years 2007, 2010, 2013, and 2016 are included for Christian County in *Appendix H*. Biogenic emissions have been excluded from these projection tables. Biogenic emissions for the base year 2002 can be found in *Appendix D*. Based on information received from EPA, biogenic emissions are expected to remain stable throughout the projection period.

Tables 6 through 8 show the projection of emissions through 2016. Christian County's projected 2016 total emissions for both VOC and NO_x are below the 2004 total emissions, thus demonstrating continued maintenance of the 8-hour ozone standard.

Table 7 and the carbon monoxide portion of Table 9 are not used to set budgets, but are included for informational purposes only.

TABLE 6.
CHRISTIAN COUNTY 8-HOUR OZONE MAINTENANCE AREA
PROJECTED VOC EMISSIONS
(TONS PER DAY)
2002-2016

COUNTY	2002	2004	2007	2010	2013	2016
POINT	1.77	1.87	2.04	2.22	2.27	2.46
AREA	4.36	4.40	4.47	4.57	4.50	4.55
HIGHWAY	4.30	3.83	3.17	2.68	2.31	2.08
NON-HWY	1.44	1.33	1.14	1.02	0.96	0.93
TOTAL	11.87	11.43	10.82	10.49	10.04	10.02

*Calculated using MOBILE 6.2

TABLE 7.
CHRISTIAN COUNTY 8-HOUR OZONE MAINTENANCE AREA
PROJECTED CO EMISSIONS
(TONS PER DAY)
2002-2016

COUNTY	2002	2004	2007	2010	2013	2016
POINT	0.07	0.07	0.07	0.07	0.07	0.07
AREA	1.83	1.84	1.89	1.92	1.89	1.91
HIGHWAY	48.18	40.56	32.15	28.47	26.09	25.31
NON-HWY	20.78	21.24	21.72	22.00	22.03	22.38
TOTAL	70.86	63.71	55.83	52.46	50.08	49.67

*Calculated using MOBILE 6.2

TABLE 8.
CHRISTIAN COUNTY 8-HOUR OZONE MAINTENANCE AREA
PROJECTED NOX EMISSIONS
(TONS PER DAY)
2002-2016

COUNTY	2002	2004	2007	2010	2013	2016
POINT	1.38	1.42	1.48	1.55	1.60	1.67
AREA	0.14	0.14	0.14	0.14	0.14	0.14
HIGHWAY	10.62	9.53	8.13	6.59	4.97	3.83
NON-HWY	3.89	3.80	3.55	3.23	2.83	2.38
TOTAL	16.03	14.89	13.30	11.51	9.54	8.02

*Calculated using MOBILE 6.2

The emissions inventory is broken down into four components: point, area, highway mobile, and non-highway mobile sources. Using 2004 as the attainment year, the subsequent years were chosen at three-year or longer intervals and project maintenance for at least a 10-year period pending approval of the revision of the SIP. Necessary calculations for the projections were made using EXCEL software. A description of how growth factors for each emission category were obtained and used follows. The documentation showing how emissions were grown is included in *Appendix H*.

Point Source Projections

For this inventory purpose, point sources are defined as stationary sources that emit 10 tons or more per year (tpy) of VOC, or 100 tpy or more of NO_x or CO. Emissions are calculated from data collected annually from point sources. 2002 Point source information is stored in an existing Kentucky I-Steps database and this database has been provided for the U.S. EPA's 2002 National Emissions Inventory (NEI).

Utilizing Standard Industrial Codes (SIC), all point source emission projections were based on growth factors calculated using Bureau of Economic Analysis (BEA) projection data for employment, as suggested by the U.S. EPA and as utilized for previous point source projections approved by U.S. EPA. The point source data provided SIC codes used to determine a short title description that matched the corresponding description found in the BEA data. The application of growth factors for each projection was then used for point sources. *Appendix H* provides information on how point source projections were determined.

Area Source Projections

Area sources can be defined as those sources that are generally too small and/or too numerous to be handled individually in the point source inventory. Emissions are estimated by multiplying an emission factor by a known indicator of collective activity such as number of employees or population. For area source emission projections, population growth factors for each chosen year were calculated using an exponential formula in the EXCEL software. The application of these growth factors for each projection was then used for area sources. Information used to

calculate growth factors, including population information used to project area sources was provided by the University of Louisville Urban Data Center and can be found in *Appendix H*.

Non-Highway Mobile Source Projections

The non-highway mobile category is broken down into three groups that include 2 and 4-cycle gasoline engines and diesel engines (other non-highway engines), railroad locomotives, and aircraft. Emissions are estimated by multiplying the base year inventory by a known indicator of collective activity such as fuel consumed or landing/takeoff operations. For locomotive and aircraft emission projections, population growth factors for each chosen year were calculated using the before mentioned formula. The application of these growth factors for each projection was then used for each of these non-highway categories. For other non-highway categories (e.g., industrial equipment, tractors, leaf blowers), the U.S. EPA's June 2004 nonroad model was used to determine the future year projections. Nonroad model and non-highway projection information can be found in *Appendix H*. Updated minimum and maximum summer temperatures and ambient temperatures were utilized for input into the nonroad model. EPA Volume IV mobile source guidance was followed in determining the updated temperature data. See the baseline inventory in *Appendix D* for specific temperature documentation.

Highway Mobile Source Projections

To calculate future highway mobile source emissions, the Division obtained data on Daily Vehicle Miles Traveled (DVMT) and speeds for 2002, 2004, 2007, 2010, 2013, and 2016 from the Kentucky Transportation Cabinet (*Appendix H*). The Division ran U.S. EPA's MOBILE6.2 model, the latest highway mobile source emission factor estimation modeling software approved by U.S. EPA, to derive appropriate projection year emission factors that were multiplied by the

corresponding DVMT to determine the projected highway mobile source emissions. These data and documentation on how these projections were performed can be found in *Appendix H*, including MOBILE6.2 input and output files used to compute the highway mobile source 2002 emissions and subsequent emission projections for 2004, 2007, 2010, 2013, and 2016. Baseline inventory documentation in *Appendix D* provides the minimum and maximum summer temperatures were used for the highway mobile source calculations.

An updated 2004 motor vehicle emissions budget for the Kentucky portion of the Clarksville-Hopkinsville, TN-KY MSA, was developed using MOBILE6.2 in consultation with the U.S. EPA, in addition to a 2016 motor vehicle emissions budget. Tennessee will develop the mobile budget for the Tennessee portion of the area through the Tennessee SIP.

It is important to note that both the 2004 and 2016 mobile source emissions projections for VOC and NO_x included in Table 9 of this section will apply to future transportation conformity determinations for the Clarksville-Hopkinsville, TN-KY MSA.

For required regional emissions analysis years that involve the years prior to 2016, the applicable budget for the purposes of conducting transportation conformity analyses will be the 2004 VOC (3.83 tpd) and NO_x (9.53 tpd) motor vehicle emissions budget for this maintenance area. For required regional emissions analysis years that involve the year 2016 or beyond, the applicable budget for the purposes of conducting transportation conformity analyses will be the 2016 VOC (2.08 tpd) and NO_x (3.83 tpd) motor vehicle emissions budget for this maintenance area. The

MVEBs are directly reflective of the on-road mobile emissions for the specified year and pollutant.

TABLE 9.
CHRISTIAN COUNTY 8-HOUR OZONE MAINTENANCE AREA
HIGHWAY MOBILE SOURCE PROJECTED EMISSIONS
(TONS PER DAY)
2002-2016

POLLUTANT	2002	2004	2007	2010	2013	2016
VOC	4.30	3.83	3.17	2.68	2.31	2.08
CO*	48.18	40.56	32.15	28.47	26.09	25.31
NO_x	10.62	9.53	8.13	6.59	4.97	3.83

*DOES NOT APPLY TO MOBILE BUDGETS

TOTAL OF ALL EMISSIONS

It is important to recognize the differences between the 2002 tpd levels and the projected tpd levels for each pollutant for the year 2016. Table 10 shows that Christian County's projected 2016 emissions for all pollutants are less than the 2004 attainment year emissions. This demonstrates continued maintenance of the 8-hour ozone standard.

TABLE 10.
CHRISTIAN COUNTY 8-HOUR OZONE MAINTENANCE AREA
2002 – 2004 – 2016 EMISSIONS COMPARISONS
TOTAL EMISSIONS (TONS PER DAY)

SOURCE CATEGORY	2002			2004			2016		
	VOC	CO	NO_x	VOC	CO	NO_x	VOC	CO	NO_x
POINT	1.77	0.07	1.38	1.87	0.07	1.42	2.46	0.07	1.67
AREA	4.36	1.83	0.14	4.40	1.84	0.14	4.55	1.91	0.14
HIGHWAY MOBILE	4.30	48.18	10.62	3.83	40.56	9.53	2.08	25.31	3.83
NON-HWY MOBILE	1.44	20.78	3.89	1.33	21.24	3.80	0.93	22.38	2.38
TOTAL EMISSIONS	11.87	70.86	16.03	11.43	63.71	14.89	10.02	49.67	8.02

PLAN TO MAINTAIN AIR QUALITY

The Commonwealth of Kentucky and U.S. EPA have instituted programs that will remain enforceable and are hereby submitted as a plan to maintain air quality which meets the NAAQS for the 8-hour ozone standard. Sources are prohibited from reducing emission controls following the redesignation of the area.

- ⇒ All new major VOC sources locating in Kentucky shall as a minimum apply control procedures that are reasonable, available, and practical;
- ⇒ Federal Motor Vehicle Control Standards apply in Kentucky;
- ⇒ Transportation conformity;
- ⇒ Prevention of Significant Deterioration requirements;
- ⇒ Federal Controls on certain nonroad engines (e.g. diesel and other fuel requirements, industrial diesel equipment, locomotives) after 2000.

In addition to these measures, further reductions will be achieved throughout the continued implementation of new federal regulations to further control the emission of Hazardous Air Pollutants that are VOCs (40 *Code of Federal Regulations* 63, NESHAPS). The reductions cannot be quantified at this time, but will be reflected in future assessments.

EXISTING MONITORING NETWORK

In addition to the maintenance plan discussed above, the existing ozone monitor located within Christian County, Kentucky, of the Clarksville-Hopkinsville Ozone Nonattainment area will continue to be operated by TVA staff. The Kentucky Division for Air Quality performs the quality assurance performance audits at the site, and TVA staff performs the data audits. TVA staff submits the monthly ozone data directly to U.S. EPA/AQS in accordance with U.S. EPA procedures and guidelines. The monitor will continue to remain operational in accordance to 40 CFR 58.

If TVA is unable to continue collecting the monitoring data, this agency will consider all available options to take over the monitoring of ozone for Christian County.

CONTINGENCY MEASURES

Future reviews of actual emissions for this redesignated area will be performed using the latest emission factors, models, and methodologies. For these periodic inventories, the Commonwealth will review the assumptions made for the purpose of the maintenance demonstration concerning projected growth of activity levels. If any of these assumptions appear to have changed substantially, the Commonwealth will re-project emissions.

In the event that a measured exceedance of the 8-hour ozone design value is measured in any portion of the maintenance area, or if periodic emission inventory updates reveal excessive or unanticipated growth greater than 10% in ozone precursor emissions, the state will evaluate existing control measures to see if any further emission reduction measures should be implemented at that time.

In the event of a monitored violation of the 8-hour ozone NAAQS standard in the Clarksville-Hopkinsville nonattainment area, the Commonwealth commits to adopt, within nine months, one or more of the following contingency measures to re-attain the standard. All regulatory programs will be implemented within 18 months.

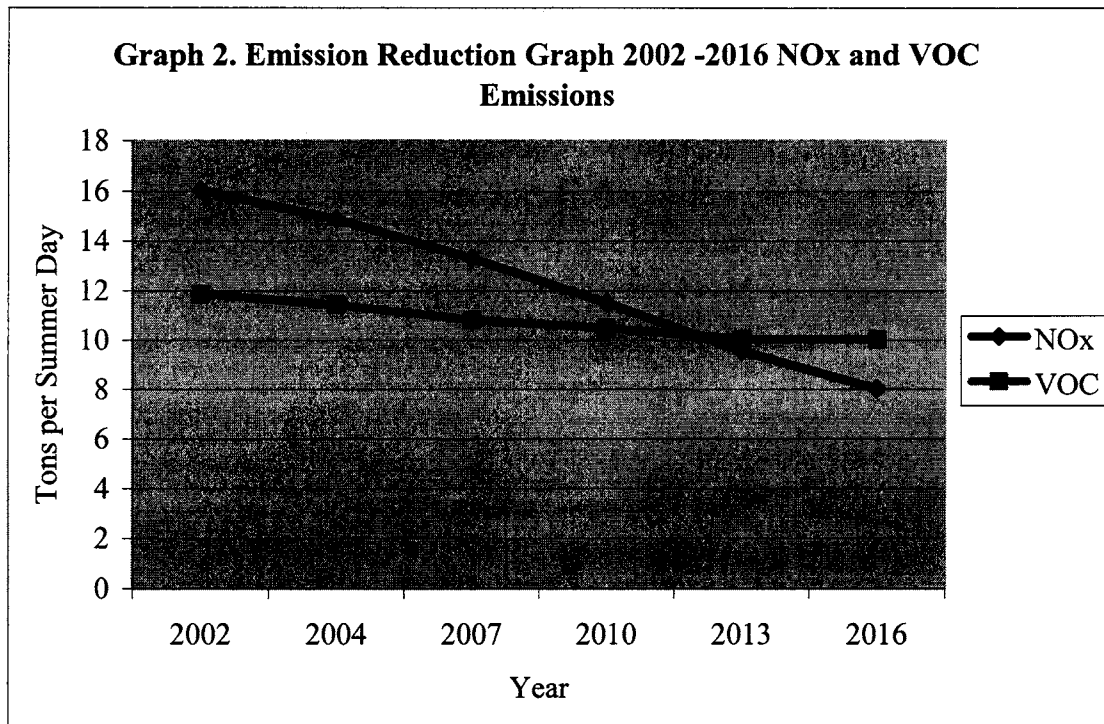
- ✓ Implementation of a program to require additional emission reductions on stationary sources;
- ✓ Implementation of a program to enhance inspection of stationary sources to ensure emission control equipment is functioning properly;
- ✓ Implementation of Stage I Vapor Control;

- ✓ Implementation of Stage II Vapor Recovery;
- ✓ Open burning restrictions during ozone season;
- ✓ Implementation of fuel programs, including incentives for alternative fuels;
- ✓ Restriction of certain roads or lanes to, or construction of such roads or lanes for use by, passenger buses or high-occupancy vehicles;
- ✓ Trip-reduction ordinances;
- ✓ Employer-based transportation management plans, including incentives;
- ✓ Programs to limit or restrict vehicle use in downtown areas, or other areas of emission concentration, particularly during periods of peak use;
- ✓ Programs for new construction and major reconstructions of paths or tracks for use by pedestrians or by non-motorized vehicles when economically feasible and in the public interest.

The Commonwealth also reserves the right to implement other contingency measures if new control programs should be developed and deemed more advantageous for the area.

Section 175A(b) of the Clean Air Act requires that eight years after formal redesignation, the state continues to provide for maintenance of the standard for an additional ten years. If this requirement remains applicable for this area, the Commonwealth commits to submit to U.S. EPA a plan for future maintenance of the standard in Christian County as required.

The following graph illustrates the decline in VOC and NO_x emissions for Christian County from 2002 through the attainment year 2004, and projected emissions through 2016.



PUBLIC PARTICIPATION

Kentucky conducted a public hearing to receive comments on this proposed SIP revision to redesignate Christian County on April 18, 2005, at the Christian County Commerce Center, 2800 Ft. Campbell Blvd., Hopkinsville, Kentucky. A copy of the public hearing notice and a copy of the advertisement is included in *Appendix I*.

A copy of the Environmental and Public Protection Cabinet's responses to comments received during that public review period is included as *Appendix J*.

APPENDIX SUMMARY

APPENDIX A – *FEDERAL REGISTER*, VOL. 69, NO. 84, APRIL 30, 2004, “AIR QUALITY DESIGNATIONS AND CLASSIFICATIONS FOR THE 8-HOUR OZONE NAAQS”

APPENDIX B – USEPA MEMORANDUM FROM JOHN CALCAGNI, JUNE 23, 1992, “SUBJECT: PROCESSING OF SIP SUBMITTALS,” AND USEPA MEMORANDUM FROM JOHN CALCAGNI, SEPTEMBER 4, 1992, “SUBJECT: PROCEDURES FOR PROCESSING REQUESTS TO REDESIGNATE AREAS TO ATTAINMENT,” AND USEPA MEMORANDUM FROM MICHAEL H. SHAPIRO, SEPTEMBER 17, 1993, “SIP REQUIREMENTS FOR AREAS SUBMITTING REQUESTS FOR REDESIGNATION TO ATTAINMENT OF THE OZONE NAAQS ...”

APPENDIX C – AQS/USEPA DATABASE, “TVA’S 8-HOUR AMBIENT OZONE DATA FOR 2001 THROUGH 2004”

APPENDIX D – 2002 BASELINE EMISSIONS INVENTORY METHODOLOGY AND DOCUMENTATION, AND SUPPLEMENTS A THROUGH C

APPENDIX E – MOBILE MODEL RUNS AND DOCUMENTATION

APPENDIX F – 401 KAR 50:012 RACT

APPENDIX G – NON-HIGHWAY MOBILE RUNS

APPENDIX H – EMISSIONS PROJECTIONS INVENTORY METHODOLOGY AND DOCUMENTATION

APPENDIX I - NOTICE OF PUBLIC HEARING AND LEGAL DOCUMENTATION

APPENDIX J – STATEMENT OF CONSIDERATION